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NOTES ON MUNICIPAL GOVERNMENT

The Struggle Against Preventable Diseases

Typhoid and Tuberculosis

A SYMPOSIUM

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CITY OF GLASGOW.

By ROBERT CRAWFORD, LL.D., Ex-Councillor, Ex-Burgh Magistrate, Ex-Chairman of the Committee on Health of Glasgow, Member for Ten Years of Committee on Street Railways, Justice of the Peace and Deputy Lieutenant of the County of the City of Glasgow.

The history of municipal action in relation to infectious diseases is well illustrated by the movement of enteric fever in Glasgow during the last thirty or forty years.

Until the passing of the infectious diseases compulsory notification act, in 1889, which brought early knowledge of the occurrence of these diseases to the local authority, it was only by a close scrutiny of the causes of deaths which had been registered or a friendly intimation received by the corporation medical officer from private practitioners that the work of suppression or prevention could be carried on.

The cholera experiences of the first half of the century had shown that water might under some circumstances of excrementary pollution become a carrier of infection, and in 1858 the theory was applied to the distribution of enteric fever at Penrith by Dr. William Taylor. Further support was

given to the suggestion by an outbreak in 1870 (Ballard), and the Leeds cases in 1872 (Robinson); while in 1870 Professor Bell had related a similar association with scarlet fever at St. Andrews. In 1873 an outbreak of enteric fever in the Parkhead District of Glasgow afforded an opportunity of tracing the infection to precedent cases in a dairyman's family, and subsequent outbreaks served to show the necessity for reforming the conditions of dairy farming. The introduction of a pure water supply from Loch Katrine, which was substituted for Clyde water in 1859, had tended permanently to lower the mean line of diarrhoeal fatality in Glasgow, but this decrease had been unequally distributed over the various ages of life, and was most marked at ages of five years and upwards. Impure water was, therefore, less active in the production of diarrhoeal diseases in infants and young children than in those of older years. But the advantages of a pure water supply might be counteracted by extraneous causes. Isolated groups of population, and especially country farm houses, were still dependent upon local springs liable to pollution, and when this unprotected supply became contaminated with specific infection, milk epidemics of enteric fever could attain considerable magnitude within the area of Glasgow's pure water supply. The reduction of enteric fever, therefore, in a town otherwise well watered and sewered could only be attained by acting directly on the immediate producer of milk supply, to wit, the dairy farmer, and the sanitation of dairy farms was seen to be as important for the town consumer as any other unsanitary conditions which affected or arose from his more immediate surroundings.

It became, therefore, very important to educate the dairy farmer and the milk purveyor regarding the essential requirements of hygienic milk production. In both cases it was a process of education, stimulated by the commercial relations between the buyer and seller. If the infection spread in a milk supply, the business of a milk purveyor was ruined. The purveyor's only safe course was to obtain milk from a farm which presented a high standard of sanitary equipment, and dairy technique: the farmer who aimed at any other found himself without a market for his product. But in addition to this, where enteric fever had obtained a lodgment in sections of a city population where sanitation was at a low level, and nuisances were chronic, persistent cleansing of ashpits, courts, and the immediate surroundings of houses generally was seen to be necessary. This implied a thoroughly equipped city cleansing department as well as the exercise of daily sanitary supervision. On these aspects of the question, therefore, the main work of prevention rested, but it was necessary, further, for the municipality to make provision for such cases of enteric fever as occurred, and the following table well illustrates not only the decreasing prevalence of the disease, but also the ready manner in which the population availed themselves of the provision of municipal and free hospital accommodation in the increasing proportion of the total deaths occurring in hospital from this disease:

Enteric Fever.

<i>Period.</i>	<i>Total deaths.</i>	<i>No. of deaths in hospital.</i>	<i>Death rate per million.</i>	<i>Per cent of Deaths in hospitals to total deaths.</i>
1865-1869	1,140	79	510	7
1870-1874	1,111	179	453	16
1875-1879	1,097	264	436	25
1880-1884	1,032	379	399	37
1885-1889	497	210	182	42
1890-1894	641	421	205	66
1895-1899	847	677	189	79
1900-1904	704	600	155	87
1905	53	45	67	85

The declining prevalence of enteric fever is shown by the following table, which simply indicates the numbers notified during the years 1892-1905, and from January to November, 1906:

Glasgow. Enteric Fever. Number of Cases Notified.

<i>Year.</i>	<i>No. of Cases</i>	<i>Year.</i>	<i>No. of Cases.</i>
1892	563	1900	1,007
1893	715	1901	1,251
1894	792	1902	700
1895	799	1903	937
1896	701	1904	621
1897	907	1905	454
1898	1,210	1906, Jan. to Nov.....	327
1899	1,080		

Consumption.—It may be said generally that the position of consumption in relation to public health administration is presently in a condition of transition. Until recent years no concentrated effort has been directed specially against the disease, and yet in the country generally it has undergone a remarkable diminution, and in the City of Glasgow this is equal to 56 per cent in the course of the last forty years. How much of this is due to the increased wellbeing both in matters of food and comfort generally can scarcely be stated with any degree of precision. Better houses, a higher standard of living, and probably the increased consumption of butcher meat, have all played their part; but the drying of sub-soils by efficient under-drainage, removal of slums, and the substitution of wider streets, providing more light and purer air, are factors which cannot be left out of account. The almost complete immunity of nomad tribes to tuberculosis suggests that mankind is not susceptible to the disease except under artificial conditions of life, and some part of this original immunity would appear to have been restored to city populations living under modern sanitary conditions.

In addition to this, however, the striking change which has occurred in the sex incidence of the disease, suggesting, as it does, the part played by factory legislation in promoting reduction among women, also supplies a further illustration of the causes which have produced the general reduction to which I have adverted. But tuberculosis has a social as well as a sanitary aspect. Few diseases produce such disastrous effects, short of death, on family life. Not only is the patient incapacitated for strenuous work, he must in many cases be maintained for years, and during this period the conditions of the home may be such that others of the family are infected.

In a recent inquiry it was found that in about one-half of the cases which were inquired into the precautions taken against sputum infection were incomplete, and that where these cases occurred in one apartment house the risk of spread to other members of the family was almost unavoidable. Many towns have systems of voluntary notification, and generally it is coming to be admitted that before specific measures can be taken for the suppression of the disease a knowledge of its incidence is necessary. And for this reason the Glasgow Corporation recently adopted the principle of compulsory notification. For ten years it has been the custom to disinfect the rooms, clothing, etc., of consumptives at death and during the currency of the disease. Voluntary effort has meanwhile supplied facilities for the treatment of a limited number of patients in the early stages, and by means of tuberculosis dispensaries touch has been maintained between the municipality and certain patients.

Social Factors in the Spread of Tuberculosis.—Defective housing conditions, with concomitant intemperance and occupational risks reveal the essential relationship between tuberculosis and poverty. Neglect of precaution against sputum increases as the available house-room diminishes, until we reach 65 per cent of the cases in lodging houses, who take no precaution whatever. For effective prevention, each case as it occurs should be made the rallying point of administrative action, so that the physical circumstances of faulty structure and defective ventilation, whether in house or workshop, which it reveals, may be remedied. Action in this direction is quite as necessary as education in precautionary methods.

Classification of Cases.—For administrative purposes, some classification is necessary, but this must, obviously, have reference rather to the object in view than to the pathological condition present. It cannot be too frequently reiterated that the prevention of phthisis will only be accomplished by removal of the conditions which foster it. Phthisis prevails in our midst because of the low standard of housing we are still perforce compelled to accept. No provision of sanatoria for early cases, or of homes of rest for the very advanced, will, in the least degree, abate the necessity for keeping this steadfastly in view. Forms of individual relief are useful and valuable adjuncts—they may provide for the segregation of the actively infective, or place the incipient case in the way of improvement—but the reduction of phthisis in the past has proceeded without organized help of either kind. With the modern views regarding the part played by sputum, and especially

by droplet infection, in spreading the disease, however, some supervision of the individual may reasonably be added; and the form which this supervision should take suggests the administrative classification necessary.

Most urgently requiring administrative supervision, there must, I think, be placed first those patients where cough is urgent and expectoration profuse, and where the size of the house or the conditions of its occupancy establish for the other inmates a risk of infection. Should it be impossible to meet this by obtaining observance of the relatively simple precautions which are necessary, it would be a perfectly logical development of administrative supervision to offer the patient an opportunity of removal, because we should thereby remove a center of infection. But removal to hospital in the ordinary sense is not applicable. A patient removed for any of the infectious diseases usually dealt with leaves his home with the prospect of returning well. Here there is no such prospect, and removal could only be urged on the plea of unavoidable risk to the remaining inmates; and even then the complete picture is only supplied by the conception of district homes, to which relatives would have ready and convenient access.

The Question of Sanatorium Treatment.—So far administrative action proceeds on a definite basis. It is directed towards the removal of center of infection when other means of controlling it fail. To proceed beyond this is to enter the field of experiment.

The general question of the utility of sanatorium treatment need not here detain us. Its value in selected cases and under given conditions is admitted. Can we select the cases and ensure the conditions, especially those which demand attention after the patient's dismissal? We have not in this country any organization comparable to the Imperial Insurance Department of Germany, which is so frequently urged as an example to be followed. Under it the insurance institutions are bound to assist with money the relatives of any sick person undergoing treatment, if, until then, they were supported by his earnings. In addition, effort which appears to be frequently successful, is made to procure suitable accommodation and work for the patient after his discharge. All this presupposes an economic organization which does not exist in this country.

Short of complete restoration to health the sanatorium method of treatment has been modified and adapted to educative purposes, so that the consumptive may thereby obtain some experience which he may turn to useful account in his own home. And so we have systems of continued but short residence, day residence, or night residence, each with its advocates, but with few data whereby to estimate their economic value for administrative purposes.

Few cases admitted to a sanatorium fail to respond to the improved housing and feeding there provided.

Disinfection of Public Conveyances, Schools, and Places of Public Resort.—The need for this arises from the practice of indiscriminate spitting. Abatement of this practice can only be expected when educational advancement has ensured a more complete attention to the conditions upon which

infection depends. In the tramway cars spitting is already dealt with by by-laws, and many railway companies placard their carriages, stations, and retiring rooms with warnings against the practice. It is therefore by stimulation of public opinion to an appreciation of the special risks which may lurk behind simple dirtiness that any extensive reform in habits of this sort may be expected. Persistence in spitting on the floor of any place of assembly should render the offender liable to summary eviction. Actual disinfection by the local authority should be restricted to places where probability of definite infection can be established; indeed, it is doubtful whether the clauses of the existing acts could be applied in any wider sense. Schools are swept daily (although dry dusting has certain objections of its own) and washed periodically. Churches undergo a weekly sweeping. In some of the theaters considerable effort at maintaining cleanliness seems to be made.

But the circumstances which have been already referred to, showing the close association between infectivity and efficient ventilation, reveal the need for a special scrutiny of the provision made for the thorough ventilation of rooms in all plans of new houses submitted to the Dean of Guild Court, while definite effort is required to secure the ventilation of all places of assembly by measures which will be effective during the time they are in use.

Tuberculosis Dispensaries.—For executive purposes these, I think, should be ranked with the provision for isolating advanced cases as of the first importance.

Their organization should combine home supervision with treatment of the patient, and they should be able to ensure his admission to a sanatorium when this is necessary.

Their development on effective lines will, however, depend on the facilities which they have at their command for benefiting the individual patient, and co-operation between the local authority and philanthropic agencies appears to offer the most likely method of accomplishing this.

CITY OF NEW YORK.

By J. S. BILLINGS, JR., M.D., Chief of Division of Communicable Diseases,
Department of Health, New York City.

During the past ten years the prevalence of typhoid fever and tuberculosis in New York City has been sensibly decreased. In 1895 there were 322 deaths from typhoid in Manhattan and the Bronx (the old City of New York), a death rate of 1.7 per 10,000 of population. During 1905, although the population of those two boroughs had increased almost 25 per cent, yet the number of deaths was only 310 and the death rate 1.2.

The one great remedy for typhoid fever—namely, filtration of the water

supply—has as yet not been introduced in New York City. Failing that, the above figures show what can be accomplished by supervision of the milk supply, instruction of physicians and laymen as to the importance of disinfection of the discharges from cases of typhoid fever, etc.

The various watersheds from which New York City draws its water are well guarded; but no matter how careful a watch is kept over them, chances for contamination are bound to occur.

The reporting of cases of typhoid fever to the Department of Health is compulsory, and fully 95 per cent of all recognized cases are so reported. A complete history is obtained in each case—not only of the course of the disease, but as to the possible sources of infection and all such sources are most carefully investigated. Milk stores and oyster stores are visited; unsanitary conditions of the patients' homes are corrected; families of the patients are instructed, verbally and by circular, as to the danger of direct contraction of the disease and the precautions which should be observed and, finally, on termination of the case the bedding is removed by the Department of Health, disinfected and returned.

Tuberculosis.—The problem here is much more difficult than is the case with typhoid fever. The percentage of cases reported to the department is lower, although it is increasing rapidly each year.

There are many reasons for this: among them that the disease is less readily recognized; does not confine the patient to bed; and, lastly, the patient is unwilling to have it known that he has consumption. Nevertheless, a great deal has been done. During 1895 there were 6,200 deaths from all forms of tuberculosis—a death rate of 3.3. During 1905, ten years later, only 6,300 deaths occurred, although the population had increased about one-fourth, and the death rate was reduced to 2.6.

The following measures have probably been of assistance in bringing about this result: the disinfection and renovation of premises previously occupied by persons suffering from pulmonary tuberculosis; the provision of hospital care and charitable aid in suitable cases; the removal of incipient cases to sanatoria outside the city; the removal of advanced cases to hospital, whether with their consent or no; the establishment of free dispensaries where patients can obtain treatment, advice and suitable diet (milk and eggs), and, finally, the education of the general public as to the nature of the disease, the precautions to be taken against its spread; the advisability of institutional and sanatoria treatment, etc.

PHILADELPHIA.

By A. C. ABBOTT, M.D., Chief of the Bureau of Health, Philadelphia.

In the year 1903, the death rates from typhoid fever per 100,000 of population for fifteen cities located in various parts of the country were:

Pittsburg	137	Baltimore	36
Cleveland	114	Chicago	32
Philadelphia	70	Brooklyn	21
Atlanta	59	Boston	20
Washington, D. C.	49	Providence, R. I.	20
St. Louis	47	New York	18
Cincinnati	45	Detroit	17
New Orleans	40		

During the thirteen years from 1890 to 1903 the lowest annual death rate per 100,000 of population from typhoid fever in Philadelphia was 32 in 1894; the highest was 75 in 1899, and the average for the period was 46.6.

With such death rates and the annual incidence of so preventable a disease as typhoid fever amounting to from 6,000 to 7,000 cases in a city having a little less than a million and a half population, it strikes the casual observer as high time for something to be done to check it.

After years of indecision, due in part to doubt as to the cause; in part to doubt as to the best means of prevention, and in part to the uncertainty of the expense involved, Philadelphia has at last attacked the problem. The lines of attack adopted by the municipality have been projected principally in *two* directions, viz.: on the one hand toward the water supply, on the other toward the milk supply of the city. For a long time, singular as it seems to one acquainted with the facts, difficulty was experienced in convincing some of the citizens that the water supply is at fault; but with the accumulation of carefully collected evidence, doubts disappeared, and opinion in favor of either a new water supply or the adoption of appropriate measures for the purification of the old supply became unanimous. It was, therefore, decided to authorize the instalment of a system of filtration that would be of a character adequate to meet the demands both of the public health and the public convenience.

Eliminating details, it suffices to say that the scheme when finally adopted provided for the slow filtration of the water through sand beds. There were to be three filtering stations, two located on the Schuylkill River and one on the Delaware River, using the water of the respective streams. Up to the present time, two of the three stations have been put in operation, viz.: the Roxborough, supplying filtered water to the Twenty-first, Twenty-second and a small portion of the Thirty-eighth and Forty-second Wards, embracing a total population of a little over 100,000 souls; and that known as the Belmont Filtering Station, supplying all that portion of the city lying to the west of the Schuylkill River, and known as West Philadelphia, comprising the Twenty-fourth, Twenty-seventh, Thirty-fourth and a part of the Fortieth Wards, a total population of 128,933 souls.

Together, the Roxborough and the Belmont Stations have a capacity of about 97,000,000 gallons daily, when running at the customary rate.

The third station, the largest, located at Torresdale, on the Delaware

River, and not yet completed, will, when finished, have a capacity of 248,000,000 gallons daily. It is one of the largest, if not the largest, plant of the kind in existence. It is designed to supply all that portion of the city not covered by the Belmont and Roxborough Stations. Together, the three stations will deliver water at the rate of 230 gallons of filtered water per person per day for a population of a million and a half people.

The appropriations thus far made to meet the cost of construction aggregate about \$22,000,000, and it is possible that from \$3,000,000 to \$4,000,000 more will be necessary to completion. At first glance this seems a big outlay, but if three-fourths of the number of cases of typhoid fever can be prevented, and this is a much lower estimate than results thus far obtained would indicate, it is a good investment from every standpoint.

As to the results thus far observed in those districts receiving filtered water:

During 1905 there were 6,451 cases of typhoid fever in the city. There were 192 cases in the Twenty-first and Twenty-second Wards of the Roxborough filtration district, and 15 cases among the 41,424 people getting filtered water from the Belmont filtration plant. In other words, in the city, *as a whole*, there occurred as a weekly average 8.32 cases of the disease to each 100,000 of population, while in the Roxborough district there were 3.51, and in the Belmont filtration district 0.71 per 100,000 of population.

For the first ten months of the present year 8,223 cases of typhoid fever have been reported for the city as a whole, making an average weekly rate per 100,000 of population of 12.7, while from Roxborough (Twenty-first and Twenty-second Wards) there have been 260 cases, or 5.4 per 100,000 of population. In the Belmont district two periods must be considered, viz.: the first, corresponding to the months of January, February, March and the first two weeks of April, when filtered water was distributed to the same district as in 1905; and the second, from the middle of April, when the filtration district was increased to include 81,372 souls, to November 1st. In the first period 8 cases in all, or 1.3 per 100,000, were recorded as a weekly average, while in the second period (*i. e.*, from April 13th to November 1st, 1906), 104, or 4.5 per 100,000 of population, are recorded as a weekly average. In other words, the reduction in the disease in 1905 in the filtered water districts was: in Roxborough (Twenty-first and Twenty-second Wards), 57.8 per cent, and in West Philadelphia, 91.5 per cent, while for the first ten months of 1906 the reductions in the same districts were 58 per cent in Roxborough, 90 per cent in the original filtered water district of West Philadelphia, and 65 per cent in the extended district.

It is fair to presume that the reductions in both years as above noted will be markedly increased when the entire city is supplied with properly filtered water. At the present time many residents of both filtration districts spend their days in portions of the city still supplied with polluted water. They are, therefore, exposed to its dangers during those hours.

Believing milk to be a potent factor in the dissemination of typhoid

fever, the Bureau of Health has given special attention to the subject. The plan of supervision may be briefly described as follows:

A systematic investigation is made of the circumstances surrounding every case of the disease reported to the bureau. Among other data required are the location and place of residence of the patient, the location of his place of occupation or school, as the case may be; the character of water used in his house and in his place of employment (*i. e.*, filtered, boiled or raw); the name and address of his milk dealer; the length of time that the patient has been ill; and his whereabouts for the preceding month is ascertained. As these reports are brought into the office upon appropriately printed slips they are classified and filed.

Each day they are scanned with the view of determining if any unusual number are upon the route or routes of a single milk dealer. If such evidence be forthcoming—and such is occasionally the case—the establishment of the milk dealer is carefully inspected. If anyone be found in the house suffering from intestinal disorder of any character whatsoever, or if there be in the milk dealer's employ anyone coming from a house in which typhoid fever exists, the dealer is prohibited from selling milk so long as the case remains in his shop or the suspicious employee is kept in the business. If the case be removed to the hospital, the dealer is permitted to resume business after the destruction of all milk in his establishment, and the disinfection of his place and all his apparatus. If there be no illness nor suspicious person in the shop of the retailer, we consult our directory of dairymen in this and adjoining states (a special card catalogue kept in the office) and discover the names and addresses of the producers supplying milk to the retailer in the city. The dairies of such producers are all in turn inspected, and if any are found in a condition prejudicial to health, or harboring transmissible diseases, they are debarred from shipping milk until such steps are taken as to properly safeguard the public health.

By this system we have detected during the past three years not less than five important circumscribed outbreaks of typhoid fever in the city that were certainly traceable to infected milk.

By due attention to the filtration of our entire water supply, and systematic sanitary control of the milk supply, aside from all other appropriate measures, it is not an exaggeration to predict a reduction of at least 85 per cent in the frequency of typhoid in Philadelphia.

BUFFALO, N. Y.

By PROF. A. C. RICHARDSON, Buffalo, N. Y.

The prevalence of typhoid and tuberculosis in Buffalo during the past ten years may be judged from the following table, taken from the report of the Department of Health for the year ending December 31, 1905:

	<i>Typhoid.</i>	<i>Tuberculosis.</i>		<i>Typhoid.</i>	<i>Tuberculosis.</i>
1896	1.9	11.8	1901	2.7	13.3
1897	1.9	11.9	1902	3.4	12.9
1898	2.7	11.5	1903	3.5	12.3
1899	2.3	12.4	1904	2.2	12.9
1900	2.5	12.0	1905	2.2	12.1

The intake of the city's water works is situated in Niagara River, at a point where the current flows at the rate of nine miles an hour, and the city has an intercepting trunk sewer which empties into the river a quarter of a mile below this intake. But this sewer, unfortunately, does not receive *all* the city's drainage. A good deal of it goes into Buffalo River, which empties into the harbor a mile or so above the intake. At first this gave no trouble, but within the last ten years some four miles of new breakwaters have been built, and now, at some seasons of the year, when high water and easterly gales prevail, some of this contaminated water is carried out into the lake far enough to get carried down into the intake. To this fact is attributed the prevalence of typhoid in Buffalo, such as it is.

By way of a remedy, it is proposed to put a new intake out into the lake far enough to avoid taking in any of the city's sewage under any conditions of weather, and also to acquire land enough along the water front near the present water works to erect a filtering plant, should this prove necessary hereafter. Furthermore, a close watch is kept on the water supply by the city bacteriologist, and warnings to boil all drinking water are issued in the press from time to time as seems necessary. Circulars of instruction in the care of typhoid patients are also printed and sent to every family in which a case of typhoid occurs, and after a death the house is disinfected by the city fumigators without charge to the occupants.

To prevent further spread of tuberculosis, the education of the people is relied upon. There is a city ordinance which forbids spitting in street cars under penalty of a fine. This ordinance is posted in every car, and the observance of it is becoming noticeably more strict. Circulars of information in regard to the care of tuberculous patients, disinfection, etc., are printed and distributed to all who will take them and are also sent to every house from which a case is reported, physicians being required by law to report every case coming under their notice. Every house in which a death from consumption occurs is carefully disinfected and fumigated by the city.

CINCINNATI.

BY MAX B. MAY, Cincinnati, Ohio.¹

Cincinnati, unfortunately, has suffered much from the typhoid and the white plague. The prevalence of the former disease is due to the bad water supply, the water used being taken from the river at a point above which intake much sewerage flows into the river.

¹The statistics and other data were obtained from Dr. Samuel E. Allen.

The typhoid fever cases from 1896 to 1905 are as follows:

<i>Year.</i>	<i>Cases.</i>	<i>Deaths.</i>	<i>Year.</i>	<i>Cases.</i>	<i>Deaths.</i>
1896	553	164	1901	729	180
1897	305	101	1902	1,038	206
1898	443	105	1903	150	144
1899	415	122	1904	1,646	270
1900	522	119	1905	746	155

The present efficient health officer is doing all in his power to educate the public as to the cause and prevention of this disease. As soon as a case of typhoid is reported the following circular, setting forth the main causes of the disease and method of prevention, is sent to the house of the sick:

"Typhoid fever is a disease brought about by your own or somebody else's uncleanness. It is a disease of the intestinal canal. It is caused directly by the water or milk you drink, or the food you eat, getting poisoned with the discharges from persons ill with the disease—and in no other way. It is most easily acquired by those who suffer from constipation. Therefore, keep the bowels open and regular.

"Water and milk are the two articles most frequently poisoned by typhoid. Heat kills the typhoid poison. Therefore, boil all drinking water ten minutes. Scald all milk and cream, especially that intended for the young. Dirty hands may also carry the typhoid poison. Therefore, wash your hands carefully before handling any article of food or drink. Food gets poisoned, especially green stuff, by being manured with night soil, by flies crawling over it, or by contaminated dust from the street, or by being washed or watered with polluted water. Therefore, wash all vegetables and fruit intended to be eaten raw with boiled water. Keep flies out of the house and shops. Keep food supplies covered, so that flies cannot have access to them.

"If all the discharges from every case of typhoid were disinfected, there would be no more typhoid in the world. Therefore, if you have a case of typhoid in the family, disinfect every discharge, both of bowels and bladder. Do it from a sense of duty to your neighbors and to protect others in your own family. Sulphate of copper (blue vitrol) is the best typhoid disinfectant. One pound costs about ten cents, and can be dissolved in two and one-half gallons of water. (Heat may be necessary for thorough solution.) Keep a pint of this in all vessels used for discharges from the bowels and bladder. Stir the contents after using and let stand for fifteen minutes, and the poison will be destroyed. Do this with every discharge, and the patient cannot infect others.

"Clean up about your house and premises. Cleanly surroundings mean cleanly people. Typhoid fever is the filth disease. Bad odors, dirty yards, dirty houses, bad ventilation, cause lower human resistance and render you more liable to contract the disease. Therefore, be clean in every detail of housekeeping."

Tuberculosis is naturally more prevalent and is the cause of more deaths than any other disease. The number of deaths during the past decade is as follows:

<i>Year.</i>	<i>Deaths.</i>	<i>Per cent of total deaths.</i>	<i>Year.</i>	<i>Deaths.</i>	<i>Per cent of total deaths.</i>
1895	805	13.2	1901	826	13.4
1896	822	13.8	1902	736	12.8
1897	760	13.6	1903	872	14.0
1898	718	12.8	1904	999	14.19
1899	744	13.2	1905	981	15.0
1900	714	13.19			

However, an active movement has been started here to avoid and cure this dread disease. Within the near future an Anti-Tuberculosis League will be formed, the object of which will be to teach the people by means of lectures and demonstrations how to avoid and cure the white plague. During the last two weeks of October the National Anti-Tuberculosis League had its exhibits in this city, and its daily lectures were largely attended and much good was accomplished.

There is also in vogue here the system of visiting nurses, who instruct patients in their homes as to the manner and necessity of caring for themselves and their families.

DETROIT, MICH.

BY DELOS F. WILCOX, PH.D., Secretary Detroit Municipal League.

Detroit is fortunate in its water supply, and it is believed that very little of the typhoid fever in the city comes from this source. During the last fifteen years, the average number of deaths from this disease has been between fifty and sixty. There has been no perceptible increase with the growth of the city during this time.

It is believed that most of the cases of typhoid fever in Detroit are contracted elsewhere. People often come down with this disease upon their return from vacations where they have been drinking surface well water.

The question of the spread of this disease by means of flies is considered important. The Board of Health has issued, and distributes wherever needed, a circular with suggestions of precautionary measures to prevent typhoid fever and with other suggestions for the care of typhoid cases. The Board advises for the prevention of this disease:

I. To heat the water and milk to a temperature of 160 degrees Fahrenheit for at least fifteen minutes before drinking it. It should be cooled, if at all, not by the addition of ice, but by being placed in the ice chest in a vessel that has been previously scalded.

2. To protect all eatables against flies as far as possible.
3. To pour boiling water over all green vegetables used as salads.

As precautions to be taken in cases where typhoid fever has invaded a household, the board recommends the following:

1. The disinfection of all excretions of the body.
2. The disinfection of all body and bed clothing of the patient and all towels, napkins, etc., in a three per cent solution of carbolic acid in water.
3. The scalding of all eating utensils used by the patient with each meal.
4. The nurse should carefully disinfect her hands after attending the patient.
5. All articles of little value used upon the patient for cleanliness should be burned as soon as used.

The situation in Detroit with reference to tuberculosis is much more serious. The number of deaths from this cause during the past six years is shown in the following table:

1900-1901	353	1903-1904	383
1901-1902	376	1904-1905	415
1902-1903	338	1905-1906	457

The increase in population during the last six years has been between twenty and twenty-five per cent, while the increase in the number of deaths from tuberculosis, as shown by the table just given, has been nearly thirty per cent. The present population of the city is about 350,000.

The law does not specifically require physicians to report cases of typhoid or tuberculosis. It is specific only in regard to small-pox, scarlet fever and diphtheria. The Board of Health feels that the law should be amended so as to require physicians to report all consumptive and typhoid cases. The board took the matter to court some years ago to *compel* physicians to report tuberculosis cases, but the decisions were confused and nothing has come of the matter. Whenever the Board of Health learns from the death records of the death of a consumptive it undertakes to disinfect the premises and to instruct the people left in the house how to prevent the spread of the disease.

A year ago the health officer, Dr. Guy L. Kiefer, established a tuberculosis clinic. A room is set apart in the Board of Health building with a physician in charge. He instructs patients in hygiene and gives treatments when the patient is too poor to pay a regular physician. Furthermore, a nurse is sent to the house from which the patient has come to instruct the family how best to prevent the spread of the disease. Special literature has been prepared by the State Board of Health, and is furnished without cost to the local departments for distribution. In addition to this, the local authorities have prepared a card circular on "How to Prevent" and "How to Cure" consumption. This circular gives the following instructions:

- "Don't spit on the sidewalks—it spreads disease, and it is against the law.
 "Don't spit on the floors of your rooms or hallways.

"Don't spit on the floor of your shop.

"When you spit, spit in the gutters or into a spittoon. Have your own spittoons half full of water, and clean them out at least once a day with hot water.

"Don't cough without holding a handkerchief or your hand over your mouth.

"Don't live in rooms where there is no fresh air.

"Don't work in rooms where there is no fresh air.

"Don't sleep in rooms where there is no fresh air.

"Keep at least one window open in your bedroom day and night.

"Fresh air helps to kill the consumption germ.

"Fresh air helps to keep you strong and healthy.

"Don't eat with soiled hands—wash them first.

"Don't neglect a cold or a cough."

For the cure of the disease, the following instructions are given:

"Don't waste your money on patent medicines or advertised cures for consumption, but go to a doctor or a dispensary. If you go in time you can be cured; if you wait until you are so sick that you cannot work any longer, or until you are very weak, it may be too late; at any rate, it will in the end mean more time out of work and more wages lost than if you had taken care of yourself at the start.

"Don't drink whiskey, beer, or other intoxicating drinks; they will do you no good, but will make it harder for you to get well.

"Don't sleep in the same bed with anyone else, and, if possible, not in the same room.

"Good food, fresh air and rest are the best cures. Keep in the sunshine as much as possible, and keep your windows open, winter and summer, night and day—fresh air, night and day, is good for you.

"The careful and clean consumptive is not dangerous to those with whom he lives and works."

During the past summer an anti-tuberculosis exhibit was presented in Detroit as well as in Grand Rapids and one or two other Michigan cities. This exhibit was for purposes of popular education upon the means of preventing and the methods of curing consumption.

WASHINGTON, D. C.

By **GEORGE S. WILSON**, Secretary Board of Charities of the District of Columbia.

The average number of deaths from pulmonary tuberculosis during the ten years ending in 1904 was 2.727 per 1,000 of the population. The highest death rate was in 1896, when it was 3.062; and the lowest was in 1902, when it was 2.246. The total number of deaths during the calendar year 1904 was 832. Of these, 366 were white and 466 were colored. The death rate per

thousand this year from this disease was 2.623, or 13.37 per cent. of all deaths. The death rate per 1,000 for the white race was 1.644, and for the colored race 4.926. The difference in death rates from this disease between the two races is in approximately the same proportion during the last ten years. The official figures for 1905 are not yet available, but unofficial returns indicate a considerable decrease in the death rate from this disease.

During the past three years there has been a good deal of agitation on the question of the prevention and cure of the disease, and several important steps have been taken which are expected to prove beneficial. The campaign has been carried on largely by a volunteer citizens' committee on the prevention of tuberculosis, and has had the active sympathy and support of the public officials, especially the local health department. Illustrated lectures have been given for the past two winters, and a great deal of printed matter has been circulated, including brief circulars of instructions to patients how to properly protect themselves and those about them against infection. A special dispensary has been established, and nurses have been employed under the direction of the Instructive Visiting Nurse Society, who have been most helpful in instructing the poorer classes as to the proper means of cure and prevention. A private sanitarium has been organized where patients are received at the moderate sum of ten dollars per week, and in some instances patients are received for even a lesser amount. An appropriation of \$100,000 was secured last year for the erection of a hospital for the care of indigent cases. At the direction of the President of the United States a committee of medical men made an examination and inspection of all the federal buildings, and as a result regulations were promulgated to provide more effectively against the danger of infection of public employees. Notices are now permanently displayed in all public buildings, warning persons against expectorating on floors or walls. A police ordinance has been passed making it a misdemeanor to expectorate on the sidewalk. At present there is an active campaign being conducted on behalf of the bill now pending to provide for the registration of all cases of pulmonary tuberculosis and for the public care of such patients as are not able to provide care for themselves. The bill provides also for the free examination of sputum, upon request, in all cases where the disease is suspected.

The average death rate per 1,000 from typhoid fever during the ten years ending in 1904 was .593. The highest rate was in 1895, the first year of the ten, when the rate was .738. The lowest rate was in 1904, the last year of the period, when the rate was .438. The total number of cases of typhoid fever reported during the year 1904 was 1,006; 734 among the white race and 272 among the colored. The number of deaths during the year was 139. In the case of typhoid fever, as in the case of most other diseases, the death rate was greater among the colored than among the white, although the difference was not so marked as in the case of tuberculosis. The death rate among the white for the year 1904 was .355, and for the colored .634.

There has been a good deal of discussion in reference to the prevalence of typhoid fever during the past six or seven years, and, according to Dr

George M. Kober, but 50 per cent of the cases were regarded as water borne, due to the use of infected Potomac water and shallow and deep pump water drawn from polluted sub-soil. About 15 per cent of all cases were believed to have been brought to the city from summer resorts, and about 15 per cent are attributed to milk produced in typhoid infected districts. The remaining 20 per cent were believed to have been spread by the agency of flies, personal contact, consumption of raw oysters and shell-fish from sewage polluted water, and by the eating of strawberries and vegetables contaminated by infected night soil.

It is believed that the typhoid germs traveled all the way from Cumberland, on the Potomac River, a distance of 134 miles. A study of the fever epidemics at Cumberland seems to sustain this belief.

In the belief that infected water was responsible for such a large percentage of the disease, the medical profession urged the installation of a filtration plant for the city's water supply. This filtration plant was completed in the fall of 1905. It covers twenty-nine acres, and is said to be the largest in America, and, in many respects, the most modern and scientific in the world. It is reported that it eliminates from 98 to 99 per cent of all bacteria. However, much to the disappointment of the citizens of Washington, the expected decrease in typhoid fever has not yet resulted. This would seem to indicate either that the Potomac water is not as important a factor, as heretofore assumed, or that for other reasons the past year has been an unusual one for typhoid fever, and that conditions would have been much worse had it not been for the filtration plant. The subject is being thoroughly investigated by experts of the Marine Hospital and Public Health Service, and it is reported by Mr. Horton, in the *Engineering News* of November 8, 1906, "that there is as much typhoid fever this year in Cumberland and surrounding towns as during the last two years combined." As this increase of typhoid in Cumberland has not been followed by a corresponding increase in Washington, it is argued that probably the installation of the filtration plant "has already caused to some extent the expected decrease in typhoid fever." The whole subject is being very carefully studied, and it is hoped that as a result of the investigations being made it will be possible to take such steps as will materially decrease the prevalence of this disease.

A law was enacted two years ago providing for the registration of all cases of typhoid fever, so that it is now possible to secure accurate statistics on the subject.

PROVIDENCE, R. I.

By FRANK E. LAKEY, English High School, Providence, R. I.

The following statements are based chiefly on printed reports and interviews with the Superintendent of Health, Charles V. Chopin, M.D., Medical Inspector Eugene P. King, M.D., Inspector of Milk Walter O. Scott, and the Providence Society for Organizing Charity.

The prevalence of tuberculosis in Providence is uncertain. The rule requiring the reporting of this disease is very generally violated. Twenty-five cases were reported by physicians and forty-nine from out-patient department of the Rhode Island Hospital, while 318 deaths are recorded for the year. The records cover only the years 1903, 1904 and 1905. The records for typhoid fever are very complete since 1884. The total number of cases for the past ten years of typhoid fever is 1,572. The lowest was 106 in 1904, and the highest 179 in 1905.

There is no evidence that any of the cases in 1905 were due to infection of food, milk or water supply. It is more likely that they were due to infection, more or less direct, from one person to the other, or perhaps through the medium of third persons who, though not sick, were the bearers of typhoid bacilli in their intestines. No evidence points to oysters, celery, lettuce, etc., as the source. Eight cases occurred at Brown University, while twelve were among the Hebrew population. July (32), August (28) and October (26) were the heaviest months in 1905. The number of deaths was 369—a ratio of 19.55. This was the lowest ratio in the past twenty-two years, save the year 1900, when the ratio was 19.25. The success of the present treatment is seen by comparison with the ratio of 1887 (59.09) and of 1885 (52.38). Probably only two or three of the epidemics in the past twenty years can be traced to water.

The measures taken to remedy the present situation are: (1) Scientific filtration of the water supplied the city; (2) encouragement of personal cleanliness. Teachers' Circular No. 7 gives plain directions and strong reasons for constant care over the personal habits of pupils.

"Once more the health department calls the attention of the teachers to the importance of developing in their pupils habits of personal cleanliness. If such habits are to be taught the work must be unremitting, hence you are again reminded of its importance. The reason why this department is interested in this subject is because the poisons of some of the common and also of some of the most loathsome diseases are frequently contained in the mouth and nose. In such cases anything which is moistened by the saliva of the infected person may, if it touches the lips of another, convey disease. The more direct the contact the greater the danger. The belief is growing among health officers that diseases are much oftener spread by this sort of contact than they are by germs floating in the air. Even if the question of diseases and contagion did not enter into the matter at all, the subject ought to be given more attention by teachers. Our schools should not only teach reading, writing, and arithmetic, but it is perhaps as important that they should inculcate cleanliness, decency, refinement, and good manners. Cleanliness should be taught for its own sake even if it had no relation whatever to health."

A circular, plainly stated, is supplied each pupil at least once a year.

A very explicit and thorough circular is distributed free, giving directions for the care and prevention of typhoid fever. Boiling the drinking

water, the care of bed linen and clothing and the disposition of discharges of patients are emphasized.

As before noted, the exact prevalence of tuberculosis cannot be stated. Providence has a very large foreign population, chiefly employed in mills and shops. Rhode Island is the most densely populated state in the Union, and nearly three-fourths of the population is within ten miles of the City Hall—nearly one-half in Providence itself. As the city is situated on the coast, throat troubles are apt to exist. Every agency combating the "white man's plague" is over-run with patients. For the past five years 11.85 per cent of all deaths in Rhode Island have been due to tuberculosis. The large part of these have been between fifteen and forty-five years of age. In Providence the death rate has dropped in twenty-five years from 29 to 17.7 per 10,000 population. The total number in Rhode Island suffering from consumption is 2,700. There are over 1,000 cases now in Providence.

The measures taken to prevent further propagation are:

1. On the part of the city authorities an education of cleanliness. One of the factors was the extensive placing of large white enamel signs on the principal business streets. These signs bore the legend, "Do not Spit on the Sidewalk. Fine \$20." The spitting habit decreased 90 per cent at once. Of course bacilli can spread from gutters as well as from sidewalks. But people are now awake. "Spit signs" now appear in buildings and in the electric cars, and the operating company has co-operated gladly with the city from the outset. The State Board of Health furnishes free both house and pocket spit cups.

2. The District Nursing Association has one nurse who devotes her whole time to tuberculosis patients. This nurse follows up each case, sees that conditions are made as favorable as possible, that proper nourishment is procured and the family kept from infection. She works with the doctors in the free tuberculosis clinic of the Rhode Island Hospital as well as with other doctors. In the past six months 1,641 visits, covering about 270 patients, show the thoroughness of the work.

3. The Central Congregational Church has eleven patients at their homes, supplying tents and other necessities.

4. St. Joseph's Hospital for Consumptives, at Hills Grove, opened in 1905, accommodates thirty-four patients, and is mainly intended for incurable cases. Double the number would apply if there were beds enough. The care by the sisters is most excellent.

5. Pine Ridge Camp, in North Scituate (opened July, 1903), has thirty in winter and sixty patients in summer. Life in the open is insisted on all the year. Shacks of wood accommodate two patients. These have windows on all sides, and are twelve feet square.

6. At the state almshouse the patients arrive in a badly infected state. If young, they show marked gain. No nurse and no other patient has ever contracted the disease. The life is spent in the sunshine. The ward was opened in 1896.

7. The State Sanatorium was opened in November, 1905, on the shores of Wallum Lake, in the northern part of the state. The treatment is fresh air, good nutrition and rest. Only curable cases or those in an early stage are taken. Patients pay one-half of the cost of \$10 per week. The life is out of doors so far as the weather permits.

8. The milk inspector is conducting a vigorous campaign for good health. The imperative need is seen when it is stated that the inspector has found milk cans airing in a privy with open vault, a refrigerator with milk placed in a water closet, an open vault in a drumming room, in winter, cans unwashed for two and three months. The guilty ones are natives, not foreigners. In one case the milk of a store was kept in a refrigerator placed in a bed room used by four children. Prior to July 1, 1906, the law only required a low grade of purity. Convictions were difficult and long delayed. On July 1, 1906, a new law required: (1) all dealers to be licensed (licenses to be revoked if for the interest of public health; (2) all cans to be washed in the city by dealers so that only sterilized cans are returned; (3) steam chest for washing glass milk bottles; tests show bacteria decreased one-third since July 1.

The efforts made to teach people how to deal with the disease, in addition to above, are by illustrated lectures. During the coming winter the Society for Organizing Charity and the State Board of Health will offer a tuberculosis exhibit. The milk inspector is doing much to prevent contamination at the sources of milk supply by means of printed circulars and asking pertinent questions about sewerage, cleanliness of barn and person. On one route where milk bottles were used eighteen cases of typhoid developed before the authorities took charge and washed the bottles in a steam chest. No other case occurred.

The press has been a powerful factor. The city authorities, too, have issued an excellent circular under the title "Directions for the Sick."

The large cotton and woolen mill owners in Providence and over the state are organized to educate their employees, and are furnishing doctors free to advise as to nature and course of treatment. The state board will have circulars printed in English, Portuguese, French, Hebrew, etc. Other lines of manufacturing are following suit. When over 2,700 cases are known to exist and institutions can care for less than 200 (outside of the almshouse) the need of education is very great. Mill help, ignorance of foreigners and lack of accommodation make Providence a good field for missionary work.